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AMPHISBAENA SCHMIDTI, A THIRD SPECIES OF THE GENUS FROM PUERTO RICO¹ (AMPHISBAENIA: REPTILIA).

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The island of Puerto Rico is unique among the islands of the Greater Antilles in possessing two almost certainly sympatric species of *Amphisbaena*. One of them, *A. cacca*, ranges over the entire island, while the second, *A. bakeri*, is restricted to the central portion of the northwestern corner of Puerto Rico (Fig. 1). *A. cacca* has been shown to vary more widely in the western than in the eastern portion of its range (Grant, 1932; Gans and Alexander, 1962).

A recent study of the systematics and variations of the several Antilles species (Gans and Alexander, 1962; here followed for terminology) disclosed three individuals from Puerto Rico that clearly differed from both described forms in five characteristics, i.e. in more ways than the former differed from each other. The specimens were left *incertae sedis* for three reasons: two specimens came from a rather old collection; the third specimen had been collected on the diametrically opposite end of the island; and only these three out of more than 200 Puerto Rican specimens showed this character pattern.

Dr. H. Heatwole has now made available three additional specimens that stem from two coastal localities adjacent to that of the first two specimens. They make it desirable to call attention to the probable existence of yet a third species of *Amphisbaena* on the island, a situation that may have some interesting zoogeographical implications.

¹ Notes on amphisbaenids No. 11.

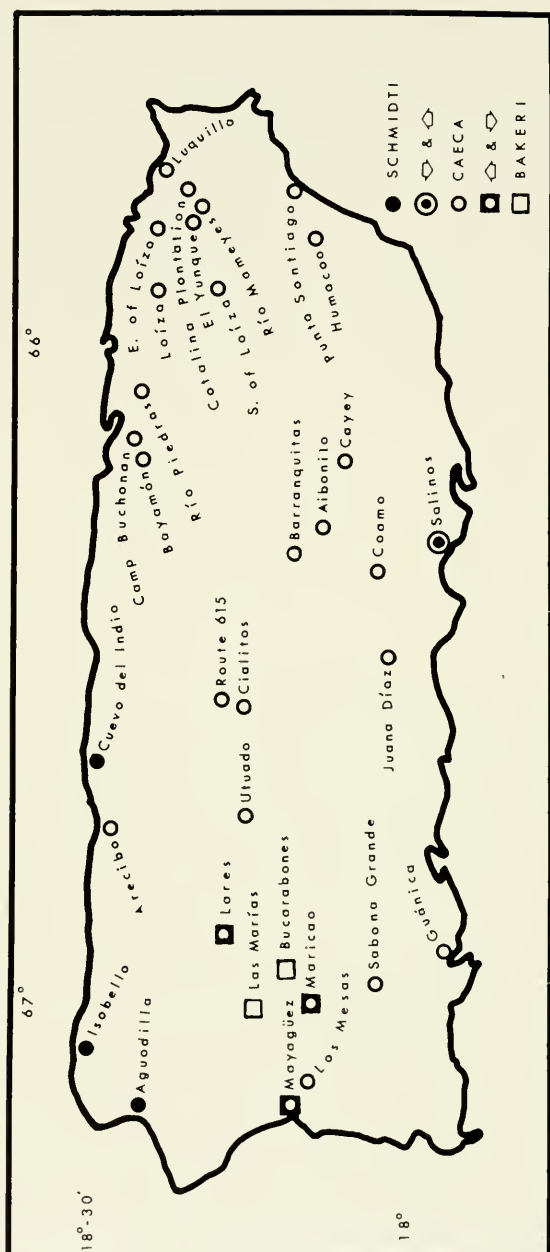


Fig. 1. *Amphisbaena*. Sketch map of the island of Puerto Rico showing the relation of the localities from which specimens have been examined. Localities from Gans and Alexander (1962) except for Coamo and Route 615 recorded on the basis of specimens now in the Michigan and UPRR collections.

I take great pleasure in naming this form for the late Karl Patterson Schmidt. The specimens belong in the collections of the Carnegie Museum (CM), the Universitetets Zoologiske Museum of København (KM), and the University of Puerto Rico at Rio Piedras (UPRRP). One of the individuals from Rio Piedras has been sent on exchange to the Museum of Comparative Zoology (MCZ). I am grateful to the curators of the several institutions, particularly to Dr. F. W. Braestrup who went to considerable trouble to check the original catalogs, and to Dr. H. Heatwole and students who made an effort to collect additional specimens. A. A. Alexander and E. E. Williams contributed by discussing this situation. Dr. Virginia Cummings prepared the drawings and Miss Charlyn Rhodes furnished technical assistance. These studies are supported by Grant G-21819 from the National Science Foundation.

KEY TO PUERTO RICAN *AMPHISBAENA*

1. Body annuli more than 205, caudal annuli fewer than 18, tail markedly shorter (Fig. 4), generally no enlarged parietals 2
 Body annuli 205 or fewer (198-202), caudal annuli 18 or more (20-22),
 tail markedly longer (Fig. 4), parietals very large *schmidti* sp. nov.
2. Body annuli 218-236, tail slightly longer (Fig. 4), internasal suture considerably shorter *cacca*
 Body annuli 239-255, tail slightly shorter (Fig. 4), internasal suture considerably longer *bakeri*

AMPHISBAENA SCHMIDTI sp. nov.

Diagnosis: A form of *Amphisbaena* without fusion of head segments; with markedly enlarged parietals; having 198 to 202 body annuli along the ventral line; 20 to 22 caudal annuli; 14 dorsal and 16 to 17 ventral segments to a midbody annulus; two rows of postgenial and one row of postmalar chin shields and 4 precloacal pores. The tail is cylindrical and its end rounded. The autotomy constriction is noticeable at the seventh to eighth postcloacal annulus and autotomy takes place here.

Holotype: MCZ 73115, a female collected by M. J. Velez, Jr., at Orilla (Cunta) Carreamo, Isabella, Puerto Rico, on 21 February 1960.

Paratypes: UPRRP 1290, a male collected with the holotype; CM 36277 from Salinas, Puerto Rico; KM R-4414 and R-4416 collected by Dr. Meinert at Agnadilla, Puerto Rico, in January

1892; and UPRRP 2502 collected by H. Heatwole along highway P.R. 681, 2 miles east of Cueva del Indio, Puerto Rico, on 14 January 1963.

Discussion: The demonstrated differences indicate that the new form is very distinct morphologically. They do not show whether it is a separate species, a (coastal?) race of *A. cacca*, or of *A. bakeri*. A case may be made for each of these. I have decided to treat the form as a full species for the following reasons: (1) The degree of morphological difference is greater than that found between conspecific populations among related species. It exceeds that between the two presently recognized species on the island. (2) The sample from Salinas contains five specimens of *A. cacca* and one of *A. schmidt*i. The coastal record of *A. cacca* from Arecibo lies midway between two records of *A. schmidt*i. Both of these cases suggest a limited degree of sympatry. (3) Specimens of *A. schmidt*i from opposite ends of the island indicate almost no geographic variation, in contrast to the situation of *A. cacca*. (4) Designation of the form as a full species does not prejudice the open question of its affinities.

Description: Meristic characters are listed in the table. Figure 2 shows the head scalation, Figure 3 the segmentation of cloaca and tail, and Figures 5 to 7 are photographs showing details of color pattern and midbody segmentation. Figure 4 shows the body proportions.

Specimens are a dark brown with very slight ventral counter-shading. None of the specimens show a dropping out of pigment on the midventral area. The smaller specimens have each segment more or less uniformly pigmented, but the two largest show a considerable additional darkening of the rectangular segmental centers. The intersegmental raphe are always lightened. Dorsal surfaces of head and tail are a uniform dark violet brown in freshly preserved specimens.

The head scalation is characterized by lack of major fusions. An azygous rostral invisible in dorsal view is followed by a pair of contacting nasals, very large elongate prefrontals, frontals, and wide and long parietals. The latter may be divided (transversely) or not. There are three supra- and three infralabials, but the angulus oris lies very slightly anterior to the posterior edge of the third pair. The second of each series is by far the largest; indeed, the second infralabials are larger than any scales but the prefrontals. A small segment lies immediately in line with the slit of the mouth and contacts the posterior half

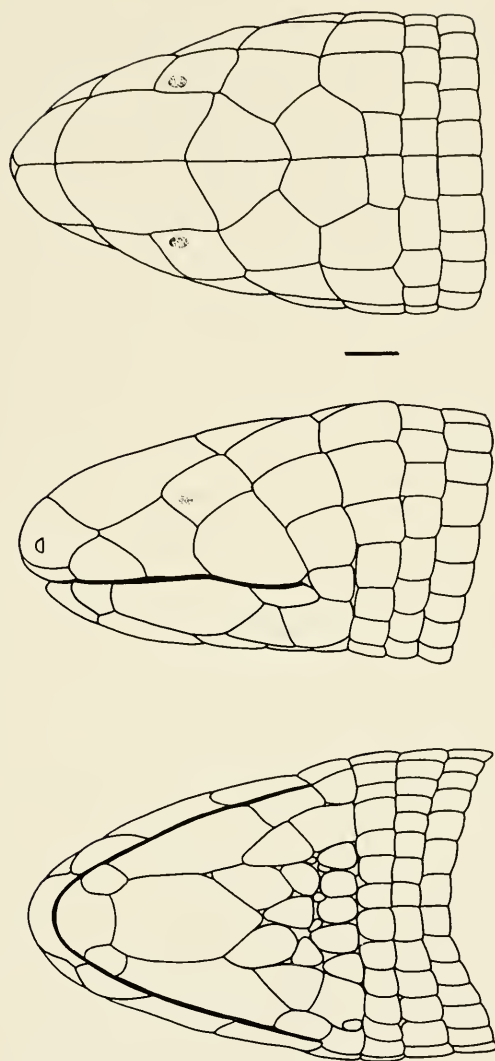


Fig. 2. *Amphisbaena schmidti*. Dorsal, lateral and ventral views of the head of the holotype, MCZ 73115 from Isabella, Puerto Rico. The line equals 1 mm to scale. (V. Cummings, del.)

of the enlarged lateral postmalar segment. The sutures between the supralabials run at angles of 45° to the slit of the mouth. The ocular is quadrangular.

The mental is T-shaped and much larger than the tiny first infralabials. The third infralabials are quite narrow. The postmental is almost as large as a second infralabial. The triangular tips of the two segments of the first postgenial row embrace it posteriorly. There are three second postgenials. The anterior tip of the median one contacts the postmental in some specimens. The malars are relatively small and contact the second and third infralabials, but are clearly excluded from contact with the postmental. The segments of the postmalar row are relatively long, the lateral ones are almost wedge-shaped. Only the anterior half of the lateral ones contacts the third infralabial; the posterior portion reaches the small segment back of the angulus oris. The postmalar row is thus counted as the first body annulus

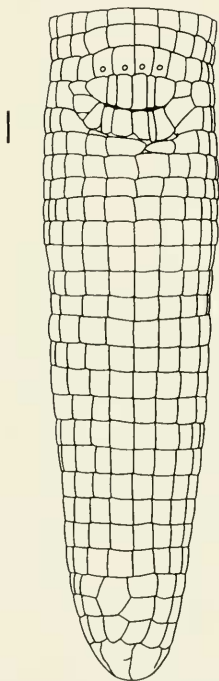


Fig. 3. *Amphisbaena schmidti*. Ventral view of cloaca and tail of the holotype, MCZ 73115 from Isabella, Puerto Rico. The line equals 1 mm to scale. (V. Cummings, del.)

as well. The lateralmost segments of the row are of the same width as the malars, and give the impression that the latter have been split.

Dorsally, the large segments of the first body annulus curve to contact the sides of the frontals. The dorsal portion of the second annulus consists of elongate segments that increase in

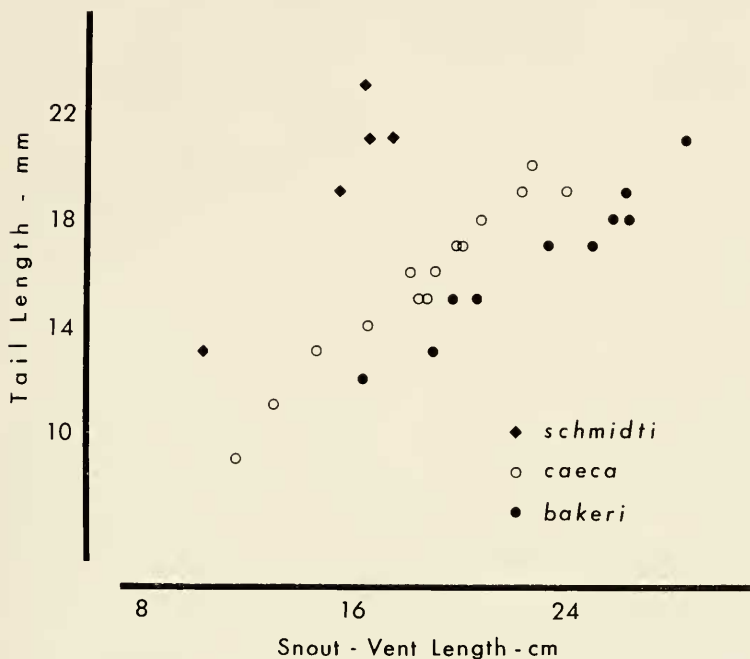


Fig. 4. *Amphisbaena*. Scatter diagram showing plot of tail length versus snout-vent length for all specimens of *A. schmidti* and *A. bakeri*, as well as specimens of *A. caeca* from western Puerto Rico. Inclusion of eastern Puerto Rico material of *A. caeca* would mask the difference between *A. caeca* and *A. bakeri*, but not affect that between the former and *A. schmidti*.

length toward the middorsal line. The posterior edge of the second annulus shows no forward curvature. There is no dorsal intercalated half-annulus, though the parietals are split into two pairs in four specimens and on one side of another.

The head is pointed, depressed, of horizontally oval cross-section. The lower jaw is but slightly shorter than the upper.

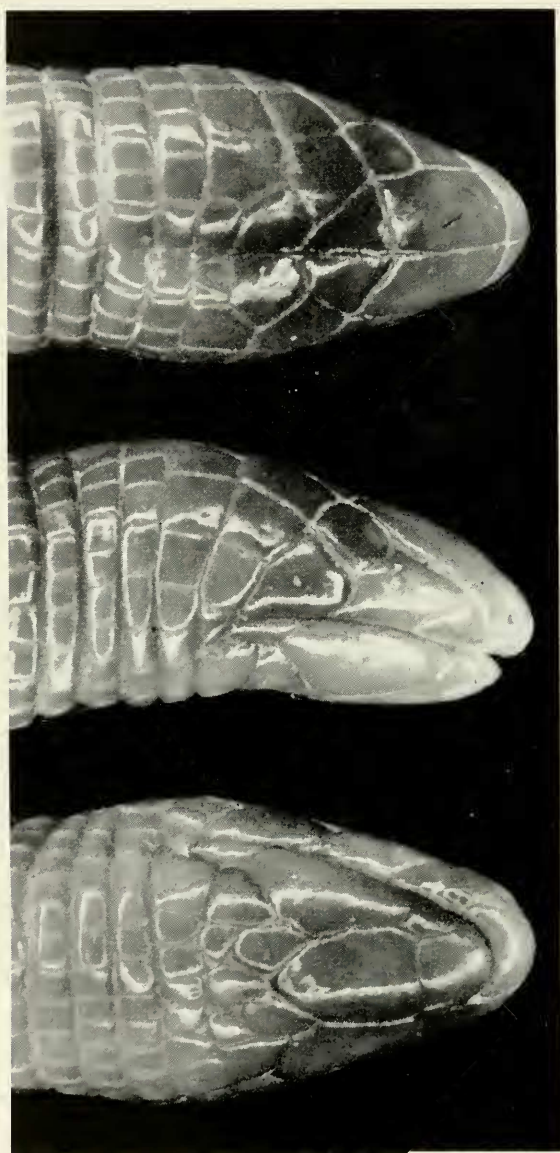


Fig. 5. *Amphisbaena schmidtii*. Dorsal, lateral and ventral views of the head of MCZ 73115, to show uniform coloration and the effect of the bulging temporal musculature.

The bulge of the temporal musculature is very noticeable, producing a concave folding of the skin along the middorsal raphe and a clear distinction of the head from the narrower neck.

There are 198 to 202 body annuli from the back of the third infralabial, up to and including the pore-bearing preloacals. The second through fifth annuli are ventrally much narrower than the succeeding ones and their segments do not line up with those following. There is no pattern irregularity in the "pectoral" region, nor are there intercalated dorsal half-annuli. There are 14 dorsal and 16 to 17 ventral segments to a midbody annulus.

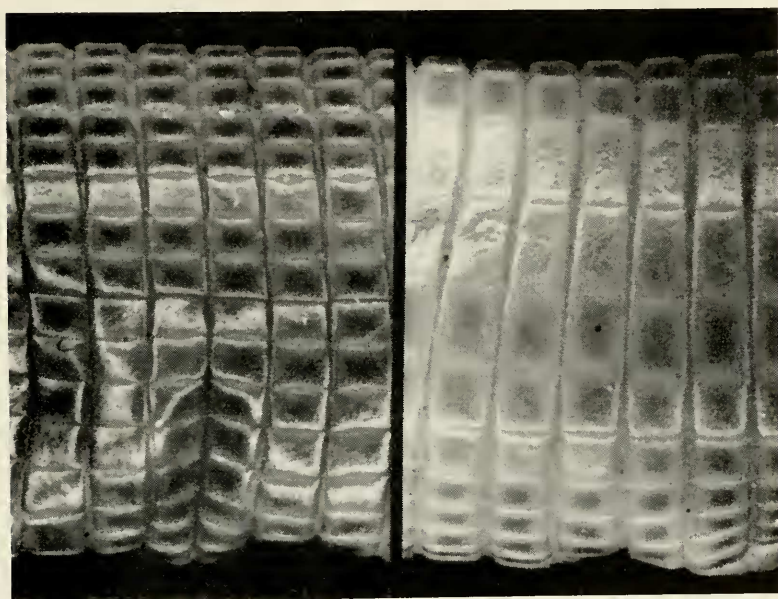


Fig. 6. *Amphisbaena schmidtii*. Dorsal and ventral views at midbody of MCZ 73115 to show segment proportions and coloration.

The cloacal region is characterized by 4 round preloacal pores which are strongly expressed in males as well as females. There are 6 preloacal and 9 to 12 postloacal segments and 3 (once, unilaterally, 4) lateral rows. The extreme lateral postloacal segments lie almost directly laterad of the extreme lateral segments of the curved preloacal shield, so that one is tempted to count them as preloacals. The autotomy annulus falls on the seventh to eighth postloacal annulus and autotomy takes place

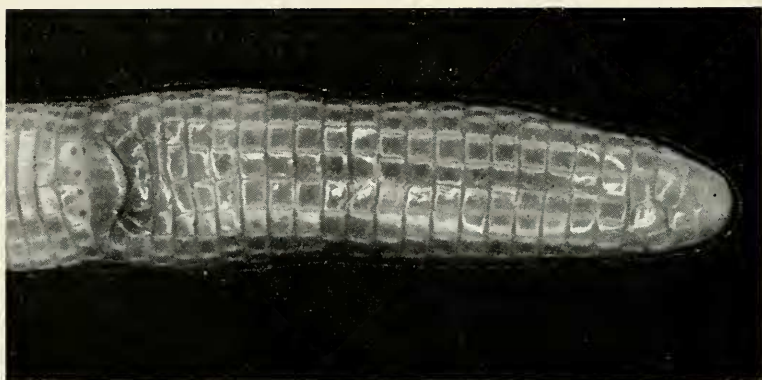


Fig. 7. *Amphisbaena schmidtii*. Ventral view of cloaca and tail of MCZ 73115 to show pore size (in a female) and coloration.

here. Specimens have 20 to 22 caudal annuli. The cross-section of the tail is circular throughout and the distal tip is capped by a hemispherical portion.

The lateral sulci are distinctly marked from back of the first quarter of the trunk length to the level of the cloaca. At their widest they are narrower than the width of one of the bordering segments. The dorsal and ventral sulcus and the lateral sulcus in the anterior quarter are indicated only by the alignment of intersegmental sutures.

The dorsal segments of a midbody annulus are approximately one and one-quarter times as long as wide, while the ventral ones are one and one-half times as wide as long.

Habits: Examination of the KM catalogs (by Braestrup) indicates that Dr. Meinert (an entomologist) excavated some termite nests on the days when the two paratypes were taken, and may have found the specimens at that time. The Cueva del Indio specimen was collected under a fallen palm leaf on humus.

Range: Coastal Puerto Rico.

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Data for specimens of *Amphisbaena schmidti*

Collection and number	Sex	A N N U L I body/tail	SEGMENTS dors./vent.	Chin segments	Cloaca	Length
KM R-4414	♀	202+3+(7) x	14/16	2-3-7	4-6-9	117+x
KM R-4416	♂	200+3+(8) 22	14/16	2-3-7	4-6-12	163+23
MCZ 73115	♀	199+3+(7) 20	14/17	2-3-7	4-6-10	154+19
UPRRP 1290	♂	202+3+(7) 21	14/16	2-4-7	4-6-12	102+13
UPRRP 2502	♂	200+3+(7) 20	14/16	2-3-6	4-6-10	165+21
CM 36277	—	198+3/4+(7) 21	14/16	3-4-6	4-6-12	173+21